

Claims

This listing of claims will replace all prior versions of claims in the application:

1. (Currently Amended) An audio signal derived bias supply for use with an electrostatic loudspeaker having at least two stators and a diaphragm, comprising:

(a) at least one transformer, adapted to receive an audio signal, and having a primary winding, and primary connection taps;

(b) a secondary winding, magnetically coupled to the primary winding, having at least ~~two~~ three secondary connection taps including a center tap, wherein the at least ~~one~~ two stators ~~is~~ are connected to at least ~~one~~ two secondary connection taps that are main audio output taps;

(c) a bias circuit, connected to at least ~~one~~ three secondary connection taps, ~~and having a~~ bias return to the center tap, wherein the bias circuit biases the diaphragm, the bias circuit further comprising:

(i) at least one rectification unit with at least ~~one~~ two rectifiers; and

(ii) at least one voltage limiter, coupled to the rectifier.

2. (Currently Amended) The bias supply as in claim 1 wherein the at least one rectification ~~means~~ unit includes at least ~~one~~ two rectifiers and at least one capacitor to form a voltage multiplier which is connected to the at least one secondary winding.

3. (Currently Amended) The bias supply as in claim 2 wherein the at least one voltage limiting ~~means~~ unit consists of a shunt regulator.

4. The bias supply as in claim 3 wherein the shunt regulator consists of at least one zener diode and at least one capacitor.
5. The bias supply of claim 4 wherein the at least one capacitor is in parallel with the at least one zener diode.
6. (Currently Amended) The bias supply as in claim 4 wherein the secondary winding further comprises at least ~~one~~two additional secondary winding taps that provide a voltage greater than the secondary signal voltage that appears ~~on~~at the secondary windings that are the main audio taps, wherein the bias circuit is connected to the at least ~~one~~two additional secondary winding taps.
7. (Currently Amended) The bias supply as in claim 1 wherein the bias circuit is adapted to receive a power signal from center taps of each of two or more ~~than one~~ transformers, and configured to supply a bias voltage to more than one electrostatic loudspeaker diaphragm.
8. (Currently Amended) The bias supply as in claim 7 wherein the ~~bias circuit is adapted to supply a bias voltage to more than one diaphragm~~ more than one transformer receives audio signals from at least two audio channels.
9. (Currently Amended) The bias supply as in claim 1 wherein a resistance is connected between the rectification ~~means~~unit and the voltage limiting ~~means~~unit.

10. (Currently Amended) The bias supply as in claim 1 wherein a resistance is connected between the rectification ~~means~~unit and the ~~one~~secondary winding.

11. (Currently Amended) The bias supply as in claim 1 wherein the at least one rectification ~~means~~unit further comprises a voltage multiplier having at least two rectifiers and two capacitors, wherein the at least one voltage limiting ~~means~~unit is connected to the voltage multiplier through at least one resistor.

12. (Currently Amended) The bias supply as in claim 1 wherein the voltage limiting ~~means~~unit further comprises:

- (1) a plurality of zener diodes in series;
- (2) a capacitance connected in parallel with the plurality of zener diodes; and
- (3) an electrostatic membrane coupled to the capacitance and plurality of zener diodes.

13. The bias supply as in claim 1 wherein the voltage limiter is connected to the electrostatic diaphragm through a resistor.

Claims 14-22 (Cancelled)

23. (Currently Amended) An audio signal derived bias supply for use with an electrostatic loudspeaker having at least two stators and a diaphragm, comprising:

(a) at least one transformer, adapted to receive an audio signal, and having a primary winding and primary connection taps;

(b) a secondary winding, magnetically coupled to the primary winding, having at least two secondary connection taps, wherein the at least two stators are connected to the at least two secondary connection taps;

(c) a bias circuit, connected to at least one secondary connection tap, having a bias return, wherein the bias circuit biases the diaphragm, the bias circuit further comprising:

(i) at least one rectification ~~means~~unit; and

(ii) at least one alternating current voltage limiting ~~means~~unit, coupled to at least two secondary connection taps~~the rectification means~~.

24. (Currently Amended) The bias supply as in claim 23 wherein the at least one rectification ~~means~~unit includes at least one diode and at least one capacitor to form a voltage multiplier which is connected to the at least one secondary winding after the alternating current voltage limiting unit.

25. (Currently Amended) A method for charging a diaphragm of an electrostatic loudspeaker, comprising the steps of:

(a) receiving an audio signal into a primary winding of a transformer;

(b) stepping up a voltage of the audio signal to a higher voltage through ~~at least one a~~ secondary transformer winding ~~of the transformer~~which has at least two secondary connection taps and a center tap;

(c) rectifying the audio signal voltage from the at least two secondary connection taps to produce a rectified voltage;

(d) applying a voltage limiter, coupled to the center tap, to the rectified voltage to produce a regulated voltage; and

(e) supplying the regulated voltage from the at least two secondary connection taps to at least one diaphragm of the electrostatic speaker to power the at least one diaphragm and charge the diaphragm faster by using the at least two secondary connection taps.

26. The method as in claim 25 wherein step (c) further comprises the step of rectifying the audio signal voltage using at least one rectifier and at least one capacitor to form a voltage multiplier which is connected to the at least one secondary winding.

27. (Currently Amended) The method as in claim 25 wherein step (c) further comprises the step of applying a voltage limiting ~~means~~unit using a shunt regulator.

28. (Currently Amended) The method as in claim 25 wherein step (c) further comprises the step of applying a voltage limiting ~~means~~unit with at least one zener diode and at least one capacitor.

29. (Currently Amended) The method as in claim 25 wherein step (c) further comprises the step of applying a voltage limiting ~~means~~unit with at least one zener diode and at least one capacitor in parallel.

30. The method as in claim 25 wherein step (c) further comprises the step of applying a resistance before the voltage limiter.

31. (Currently Amended) The method as in claim 26 wherein step (b) further comprises the step of applying a resistance before rectification ~~means~~unit and the one secondary winding.

Claims 32-37 (Cancelled)

38. (Currently Amended) An audio signal derived bias supply for use with an electrostatic loudspeaker having at least one stator and at least ~~one~~two diaphragms, comprising:

(a) at least one transformer, adapted to receive an audio signal, and having a primary winding, and primary connection taps;

(b) a secondary winding, magnetically coupled to the primary winding, having at least two secondary connection taps and a bias return, wherein the at least ~~one~~two diaphragms are connected to the at least ~~one~~two secondary connection taps;

(c) a bias circuit, connected to the at least ~~one~~two secondary connection taps and the bias return, configured to bias the at least one stator, and the bias circuit further ~~comprising~~comprises:

(i) at least one rectifier; and

(ii) at least one voltage limiter, coupled to the rectifier.

39. (Cancelled)

40. (New) A power supply for biasing a diaphragm in an electrostatic

loudspeaker system, comprising:

(a) a power supply;

(b) an amplifier, coupled to the power supply, and adapted to receive an audio signal;

(c) a transformer, connected to the amplifier to receive the audio signal, the transformer
having primary and secondary windings;

(d) a bias supply, coupled to the transformer to receive power from the secondary
windings of the transformer, and to output a bias voltage to the diaphragm;

(e) at least one stator to which the audio signal is applied; and

(f) wherein the amplifier is configured to supply a charging signal separate from the
audio signal, and the charging signal can be applied to energize the bias supply.

41. (New) The electrostatic loudspeaker system as in claim 41 wherein the charging signal can
be activated when no program signal is present.